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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/698,395	Applicant(s) LEGNAIN ET AL.	
	Examiner Raymond S. Dean	Art Unit 2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see remarks regarding Claim 8 filed December 6, 2007 with respect to the rejection(s) of claim(s) 8 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly cited reference Neufield et al. (US 6,922,435).

Neufield teaches a mutual micro-offset that is at least one chip and less than eight chips (Col. 9 lines 45 – 58, the separation can be less than eight chips and at least one chip such as 4 chips). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Rotstein in view of Wong with the above method of Neufield for the purpose of quickly and efficiently generating PN sequences at various phases for the purpose of searching for strong multipaths from a particular base station as taught by Neufield.

2. Applicant's arguments filed December 6, 2007 regarding Claims 1 and 5 have been fully considered but they are not persuasive.

Examiner respectfully disagrees with Applicants' assertion on Page 3, 1st Paragraph "Thus it is respectfully submitted that the Examiner's factual finding is an error in that Rotstein does not teach ...". The beams, 204, 206, 208, for example, use PN offsets A, B, C that are offset of shifted enough from one another thereby

preventing said beams from interfering with one another and thus preventing destructive cancellation from occurring. The offset or shift between said PN offsets is the mutual-micro timing offset.

Examiner respectfully disagrees with Applicants' assertion on Page 5, 3rd Paragraph "The portion of Rotstein does not in fact teach that". The PN offsets are separated by integer multiples of 64, which is large enough to prevent interference and small enough thus enabling the receiver to distinguish between beams A and B for example, thus preventing signal ambiguity.

Regarding Applicants' assertion on Page 3, 2nd Paragraph "This reference specifically teaches away from the use of micro-timing offsets ...", Rotstein, as detailed in the Office Action dated September 4, 2007, specifically teaches the use of micro-timing offsets in overlapping beams. Wong is cited for its teaching of a respective signal comprising a common overhead component common to all the signals. Rotstein and Wong both teach a 3G CDMA system that uses multiple beams thus Wong does not teach away from Rotstein. Furthermore, modifying Rotstein with Wong provides a system that enables the aiding each mobile in determining its highest data rate as taught by Wong. The above motivation for combining Rotstein and Wong is a comment as to the level of ordinary skill in the pertinent art. The combination of Rotstein and Wong renders a common overhead being sent on all the beams defining a coverage area.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 – 7, 9 – 17, and 26 – 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rotstein et al. (US 6,909,707) in view of Wong et al. (US 6,330,460).

Regarding Claim 1, Rotstein teaches an antenna system for a transmitter comprising: a plurality of antennas defining a respective plurality of fixed beams which together cover a coverage area (Figures 3, 4, Cols. 2 lines 24 – 31); for each antenna a respective signal generator generating a respective signal using a spreading code common to all signal generators (Col. 2 lines 24 – 53, the PN code is the spreading code, the same PN code is used by there is a different offset); transceiver circuitry connecting the signal generators to the antennas such that a respective one of the signals is transmitted by each antenna, the signals being transmitted substantially simultaneously (Col. 2 lines 24 – 29, typical base stations comprise transceivers); for each pair of antennas having overlapping beams within said coverage area, the respective signal generators using the spreading code with a mutual micro-timing offset that is large enough that destructive cancellation substantially does not occur between the signals transmitted on the pair of antennas (Figure 3, Col. 2 lines 24 – 53, the PN

code is the spreading code, the same PN code is used but there is a different timing offset, the offset assignments are chosen far enough apart to avoid interference).

Rotstein does not teach for each antenna a respective signal generator generating a respective signal comprising a common overhead component common to all the signals.

Wong teaches a respective signal comprising a common overhead component common to all the signals (Col. 7 lines 40 – 47).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the CDMA system of Rotstein with the common overhead component of Wong for the purpose of aiding each mobile in determining it's highest data rate as taught by Wong.

Regarding Claim 2, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 1. Rotstein further teaches implemented for a plurality of coverage areas, each coverage area being a respective sector served by the base station (Col. 2 lines 24 – 30).

Regarding Claims 3, 4, Rotstein in view of Wong teaches all of the claimed limitations recited in Claims 1, 2. Rotstein further teaches wherein the transmitter is a CDMA base station, and each signal is a CDMA signal (Col. 2 lines 24 – 30).

Regarding Claim 5, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 4. Rotstein further teaches wherein the respective mutual micro-timing offset is small enough that substantially no signal source ambiguity occurs at a receiver (Col. 2 lines 24 – 53, See Response To Arguments above).

Regarding Claim 6, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 4. Rotstein further teaches the sector having a sector-specific spreading code, and wherein the respective mutual micro-timing offset between each pair of CDMA signals is realized by applying the sector-specific spreading code with a respective mutual micro-offset (Figure 3, Col. 2 lines 24 – 53, the PN code is the spreading code, the same PN code is used but there is a different timing offset, the offset assignments are chosen far enough apart to avoid interference).

Regarding Claims 7, 14, Rotstein in view of Wong teaches all of the claimed limitations recited in Claims 6, 12. Rotstein further teaches a PN code (Col. 2 lines 24 – 42).

Regarding Claim 9, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 7. Rotstein further teaches half a width of a traffic search less than a window/space implemented in a mobile terminal community with the base station (Col. 2 lines 24 – 42, in CDMA systems the chip distance is 244 meters, which is less than half of 125 kilometers of search window space).

Regarding Claim 10, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 4. Rotstein further teaches wherein the respective mutual micro-timing offset is small enough that substantially no signal source ambiguity occurs at a receiver in respect of any pair of signals transmitted by adjacent antennas (Col. 2 lines 24 – 53, there will be no ambiguity at the mobile receivers due to the offset in time to avoid the overlap).

Regarding Claim 11, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 10. Rotstein further teaches wherein the short codes is of length 2^{15-1} (Col. 2 lines 24 – 42, this is the standard length for PN codes used in CDMA systems).

Regarding Claims 12, 13, 27, Rotstein in view of Wong teaches all of the claimed limitations recited in Claims 4, 26. Rotstein further teaches wherein the sector has a sector-specific spreading code, and wherein the respective mutual micro-timing offset between each pair of CDMA signals is realized by applying the sector-specific spreading code and then applying a mutual micro timing offset to respective sector-specific code generators (Figure 3, Col. 2 lines 24 – 53).

Regarding Claim 15, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 4. Wong further teaches at least one of pilot channel, sync channel, paging channel, quick paging, advanced access channel and auxiliary pilot (Col. 7 lines 40 – 47).

Regarding Claim 16, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 4. Rotstein does not teach for each active user located within the sector, at a given instant only one of the CDMA signals includes a user-specific traffic component generated by the respective CDMA signal generator

Wong further teaches for each active user located within the sector, at a given instant only one of the CDMA signals includes a user-specific traffic component generated by the respective CDMA signal generator (Col. 11 lines 11 – 30, different numbers of mobiles such as one mobile can request traffic data).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Rotstein with the above traffic feature of Wong for the purpose of yielding the highest overall aggregate data throughput as taught by Wong.

Regarding Claim 17, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 4. Rotstein does not teach wherein the one of the CDMA signals to include the user-specific traffic component for a given user is identified by analyzing signal strength on reverse links from the user, and selecting the CDMA signal corresponding with the reverse link having a best signal strength

Wong further teaches wherein the one of the CDMA signals to include the user-specific traffic component for a given user is identified by analyzing signal strength on reverse links from the user, and selecting the CDMA signal corresponding with the reverse link having a best signal strength (Cols. 8 lines 21 – 25, 11 lines 11 – 30, in order to determine the angular position the signal strength of the reverse link must be measured, determining the angular position enables the beam forming for the purposes of transmitting traffic data).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Rotstein with the above traffic feature of Wong for the purpose of yielding the highest overall aggregate data throughput as taught by Wong.

Regarding Claim 26, Rotstein teaches a method in a CDMA antenna system comprising transmitting signals on a plurality of adjacent beams of a sector ((Figures 3,

4, Cols. 2 lines 24 – 31)) with a micro-timing offset of a spreading code used by the signals transmitted on adjacent pairs of beams which is large enough that destructive cancellation substantially does not occur between the pair of beams (Figure 3, Col. 2 lines 24 – 53, the PN code is the spreading code, the same PN code is used by there is a different timing offset, the offset assignments are chosen far enough apart to avoid interference).

Rotstein does not teach transmitting signals each having a common overhead component.

Wong teaches signals each having a common overhead component (Col. 7 lines 40 – 47).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the CDMA system of Rotstein with the common overhead component of Wong for the purpose of aiding each mobile in determining it's highest data rate as taught by Wong.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rotstein et al. (US 6,909,707) in view of Wong et al. (US 6,330,460) as applied to Claim 7 above, and further in view of Neufield et al. (US 6,922,435).

Regarding Claim 8, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 7. Rotstein in view of Wong does not teach at least one chip and less than eight chips.

Neufield teaches at least one chip and less than eight chips (Col. 9 lines 45 – 58, the separation can be less than eight chips and at least one chip such as 4 chips).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Rotstein in view of Wong with the above method of Neufield for the purpose of quickly and efficiently generating PN sequences at various phases for the purpose of searching for strong multipaths from a particular base station as taught by Neufield.

6. Claims 18 and 21 – 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rotstein et al. (US 6,909,707) in view of Wong et al. (US 6,330,460) as applied to Claim 1 above, and further in view of Kapoor et al. (US 6,795,424).

Regarding Claim 18, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 1. Rotstein in view of Wong does not teach wherein the transceiver circuitry is further adapted to provide transmit frequencies in a manner such that the transmit frequencies include a frequency offset from one another.

Kapoor teaches wherein the transceiver circuitry is further adapted to provide transmit frequencies in a manner such that the transmit frequencies include a frequency offset from one another (Cols. 6 lines 41 – 47, 10 lines 58 – 60, 15 lines 19 – 29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the CDMA system of Rotstein in view of Wong with the

transceiver circuitry of Kapoor as an alternative means of suppressing interference as taught by Kapoor.

Regarding Claim 21, Rotstein in view of Wong and in further view of Kapoor teaches all of the claimed limitations recited in Claim 18. Kapoor further teaches wherein the frequency offset is chosen to further reduce undesirable effects of signal cancellation (Cols. 6 lines 41 – 47, 10 lines 58 – 60, 15 lines 19 – 29).

Regarding Claim 22, Rotstein in view of Wong and in further view of Kapoor teaches all of the claimed limitations recited in Claim 18. Wong further teaches wherein the signals have unique traffic channels (Col. 11 lines 11 – 30).

Regarding Claim 23, Rotstein in view of Wong and in further view of Kapoor teaches all of the claimed limitations recited in Claim 22. Kapoor further teaches wherein the offset frequency is a multiple other than that of a frame rate (Col. 10 lines 58 – 60, the frequency of the tone interferer and the bin can be a plurality of values thus the frequency offset can be a plurality of values and thus a multiple other than a frame rate).

Regarding Claim 24, Rotstein in view of Wong and in further view of Kapoor teaches all of the claimed limitations recited in Claim 18. Kapoor further teaches wherein the frequency offset is greater than 30 Hz and less than 120 Hz (Col. 10 lines 58 – 60, the frequency of the tone interferer and the bin can be a plurality of values thus the frequency offset can be a plurality of values).

7. Claims 19 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rotstein et al. (US 6,909,707) in view of Wong et al. (US 6,330,460) in view of Kapoor et al. (US 6,795,424) as applied to Claim 18 above, and further in view of Zhao (US 6,463,303).

Regarding Claim 19, Rotstein in view of Wong and in further view of Kapoor teaches all of the claimed limitations recited in Claim 18. Rotstein in view of Wong and in further view of Kapoor does not teach a beam-forming matrix.

Zhao teaches a beam-forming matrix (Col. 4 lines 43 – 47).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Rotstein in view of Wong and in further view of Kapoor with the beam forming matrix as an alternative means for creating multiple beams.

Regarding Claim 20, Rotstein in view of Wong in view of Kapoor and in further view of Zhao teaches all of the claimed limitations recited in Claim 19. Zhao further teaches a Butler matrix (Col. 4 lines 43 – 47).

8. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rotstein et al. (US 6,909,707) in view of Wong et al. (US 6,330,460) as applied to Claim 1 above, and further in view of Benning et al. (US 2003/0022635).

Regarding Claim 25, Rotstein in view of Wong teaches all of the claimed limitations recited in Claim 1. Rotstein in view of Wong does not teach means in the transceivers for providing transmit phases that include a time dependent phase offset

from one another, wherein the phase offset is chosen to reduce undesirable effects of signal cancellation.

Benning teaches providing transmit phases that include a time dependent phase offset from one another, wherein the phase offset is chosen to reduce undesirable effects of signal cancellation (Section 0012).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diversity method of Benning in the system of Rotstein in view of Wong as an alternative means for providing improved received signal statistics and performance as taught by Benning.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond S. Dean whose telephone number is 571-272-7877. The examiner can normally be reached on Monday-Friday 6:00-2:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban can be reached on 571-272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Raymond S. Dean
February 12, 2008